WHAT IS CLAIMED IS:

1	1. A system for establishing vascular access over a guidewire, said			
2	system comprising:			
3	a dilator having a lumen sized to be introduced over a guidewire having a			
4	pre-selected diameter; and			
5	a radially expandable sleeve having a lumen therethrough and an			
6	unexpanded diameter, said sleeve being configured to expand to a larger diameter as the			
7	dilator is advanced through the lumen of the sleeve.			
1	2. A system as in claim 1, wherein the dilator is tapered at one end to			
2	facilitate advancement through the lumen of the radially expandable sleeve.			
1	3. A system as in claim 2, wherein the dilator comprises an outer tube			
2	and an inner obturator, wherein the obturator has the guidewire lumen and the tapered end			
3	and wherein the obturator is removable from the outer tube so that the tube may be left in			
4	place within the radially expandable sleeve after expansion.			
1	4. A system as in claim 1, wherein the radially expandable sleeve has			
2	a compliant or elastic structure so that its cross-section will collapse after expansion if the			
3	dilator is withdrawn from the lumen of the sleeve.			
1	5. A system as in claim 4, wherein the radially expandable sleeve			
2	comprises a tubular braid.			
1	6. A system as in claim 5, wherein the tubular braid is a mesh of non-			
2	elastic filaments wherein radial expansion causes axial shortening of the braid.			
1	7. A system as in claim 6, wherein the braid is embedded in or			
2	covered by an elastic layer.			
1	8. A system as in claim 1, wherein the radially expandable sleeve is			
2	plastically deformable or has a locking structure so that it retains its expanded diameter			
3	after the dilator is withdrawn from the lumen of the sleeve.			
1	9. A system as in claim 1, wherein the radially expandable sleeve			
2	comprises an anti-thromhotic coating			

1	10. A system as in claim 1, further comprising a guidewire			
1	11. A system as in claim 1, further comprising a sleeve introducer			
2	having a tapered distal end and a lumen therethrough, said sleeve introduced being			
3	configured to receive a guidewire through its lumen and to be received within the lumen			
4	of the sleeve, whereby an assembly of the sleeve and sleeve introducer can be formed so			
5	that the tapered end of the sleeve introducer can be advanced through the tissue to			
6	facilitate entry.			
1	12. A system as in claim 11, wherein the guidewire has a nominal			
2	diameter of 0.89 mm (0.035 in), the dilator has a lumen diameter of 1 mm (0.4 in.), and			
3	the sleeve has a lumen diameter prior to expansion of 0.96 mm (0.038 in.).			
1	13. A system as in claim 12, wherein the dilator has an outside			
2	diameter in the range from 1.3 mm to 3.3 mm.			
1	14. A system as in claim 11, wherein the guidewire has a nominal			
2	diameter of 0.36 mm (0.014 in.), the dilator has a lumen diameter of 0.46 mm (0.018 in.)			
3	and the sleeve has a lumen diameter prior to expansion of 0.41 mm (0.016 in.).			
1	15. A system as in claim 14, wherein the dilator has an outside			
2	diameter in the range from 1 mm to 2.5 mm.			
1	16. A method for establishing vascular access, said method			
2	comprising:			
3	forming a percutaneous tissue tract to a target blood vessel;			
4	positioning a guidewire through the tissue tract;			
5	positioning a radially expandable sleeve over the guidewire and through			
6	the tissue tract with a distal end in the blood vessel and a proximal end outside the tissue			
7	tract, wherein the expandable sleeve is in a narrow diameter configuration; and			
8	expanding the expansible sleeve to a larger diameter configuration to			
9	provide an access lumen to the blood vessel.			
1	17. A method as in claim 16, wherein forming the percutaneous tissu			
2	tract comprises penetrating a needle through tissue overlying the target blood vessel,			

3	passing the guidewire through the needle, and removing the needle from over the guidewire.		
1	18. A method as in claim 16, wherein positioning the radially		
2	expandable sleeve comprises advancing a sleeve having an outer diameter which is no		
3 -	-more than 300% of the outer diameter of the guidewire.		
1	19. A method as in claim 16, wherein the radially expandable sleeve		
2	has a compliant or elastic structure so that its cross-section will collapse after expansion.		
1	20. A method as in claim 19, wherein the radially expandable sleeve		
2	comprises a tubular braid.		
1	21. A method as in claim 20, wherein the tubular braid is a mesh of		
2	non-elastic filaments wherein radial expansion causes axial shortening of the braid.		
1	22. A method as in claim 21, wherein the braid is embedded in or		
2	covered by an elastic layer.		
1	23. A method as in claim 16, wherein the radially expandable sleeve i		
2	plastically deformable or has a locking structure so that it retains its expanded diameter.		
1	24. A method as in claim 16, wherein the radially expandable sleeve		
2	comprises an anti-thrombotic coating.		
1	25. A method as in claim 24, wherein the radially expandable sleeve i		
2	positioned by advancing the sleeve behind a tapered distal tip.		
1	26. A method as in claim 16, wherein the guidewire has a nominal		
2	diameter of 0.89 mm (0.035 in.), the dilator has a lumen diameter of 1 mm (0.4 in.), and		
3	the sleeve has a lumen diameter prior to expansion of 0.96 mm (0.038 in.).		
1	27. A method as in claim 26, wherein the dilator has an outside		
2	diameter in the range from 1.3 mm to 3.3 mm.		
1	28. A method as in claim 16, wherein the guidewire has a sominal		
2	diameter of 0.36 mm (0.014 in.), the dilator has a lumen diameter of 0.46 mm (0.018 in.		
3	and the sleeve has a lumen diameter prior to expansion of 0.41 mm (0.016 in.).		

1		29.	A method as in claim 28, wherein the dilator has an outside
2	diameter in the range from 1 mm to 2.5 mm.		
1		30.	A method for establishing vascular access, said method
2 -	comprising:		
3	forming a percutaneous tissue tract to a target blood vessel;		
4	positioning a guidewire through the tissue tract;		
5		position	oning a radially expandable sleeve over the guidewire and through
6	the tissue tract with a distal end in the blood vessel and a proximal end outside the tissue		
7	tract, wherein the expandable sleeve is in a narrow diameter configuration;		
8		introd	ucing a dilator over the guidewire and through the expandable sleeve
9	to increase th	e diame	eter of the expandable sleeve to a larger diameter; and
0		remov	ving the dilator wherein the expandable sleeve retains the larger
1	diameter.		-
		21	A weekled as in alaim 20 wherein forming the percytaneous tissue
1		31.	A method as in claim 30, wherein forming the percutaneous tissue
2	tract comprises penetrating a needle through tissue overlying the target blood vessel,		
3	• •	uidewir	e through the needle, and removing the needle from over the
4	guidewire.		
1		32.	A method as in claim 30, wherein positioning the radially
2	expandable s	leeve co	omprises advancing a sleeve having an outer diameter which is no
3	more than 300% of the outer diameter of the guidewire.		
		33.	A method as in claim 30, wherein the radially expandable sleeve
l 2	has a samuli		
2	has a compliant or elastic structure, wherein the large diameter of the sleeve is maintained by an outer tube of the dilator which remains in place after the dilator is removed.		
3	by an outer t	ube of t	the dilator which remains in place after the dilator is removed.
1		34.	A method as in claim 33, wherein the radially expandable sleeve
2	comprises a	tubular	braid.
1		35.	A method as in claim 34, wherein the tubular braid is a mesh of
2	non-elastic f	ilament	s wherein radial expansion causes axial shortening of the braid.
1		36.	A method as in claim 35, wherein the braid is embedded in or
2	covered by a		

1	37. A method as in claim 30, wherein the radially expandable sleeve is		
2	plastically deformable or has a locking structure so that it retains its larger diameter after		
3	the dilator is withdrawn from the lumen of the sleeve.		
1	38. A method as in claim 30, wherein the radially expandable sleeve		
1 -	38. A method as in claim 30, wherein the radially expandable sleeve comprises an anti-thrombotic coating.		
2	comprises an anti-unomoduc coating.		
1	39. A method as in claim 38, wherein the radially expandable sleeve is		
2	positioned by advancing the sleeve behind a tapered distal tip.		
•	40. A method as in claim 30, wherein the guidewire has a nominal		
1			
2	diameter of 0.89 mm (0.035 in.), the dilator has a lumen diameter of 1 mm (0.4 in.), and		
3	the sleeve has a lumen diameter prior to expansion of 0.96 mm (0.038 in.).		
1	41. A method as in claim 40, wherein the dilator has an outside		
2	diameter in the range from 1.3 mm to 3.3 mm.		
	40 A day land a lain 20 mhanain the guidewire has a nominal		
1	42. A method as in claim 30, wherein the guidewire has a nominal		
2	diameter of 0.36 mm (0.014 in.), the dilator has a lumen diameter of 0.46 mm (0.018 in.),		
3	and the sleeve has a lumen diameter prior to expansion of 0.41 mm (0.016 in.).		
1	43. A method as in claim 42, wherein the dilator has an outside		
2	diameter in the range from 1 mm to 2.5 mm.		
	and the state of t		
1	44. An improved method for establishing vascular access, said method		
2	being of the type wherein a tapered dilator is introduced over a guidewire to enlarge a		
3	percutaneous tissue tract, wherein the improvement comprises introducing a radially		
4	expandable sleeve over the guidewire prior to introducing the dilator and thereafter		
5	introducing the dilator through the sleeve, whereby axial forces on the tissue from the		
6	dilator are reduced.		
1	45. A kit comprising:		
2	a radially expandable sleeve having a lumen therethrough and an		
3	unexpanded diameter, said sleeve being configured to be introduced over a guidewire and		
4	expand to a larger diameter as a dilator is advanced through the lumen; and		
5	instructions for use according to claim 44.		

1	46.	A kit as in claim 45, further comprising a dilator having a lumen	
2	sized to be introduced over the guidewire.		
1	_ 47.	A kit as in claim 46, further comprising the guidewire.	
1	48.	A kit as in claim 46, further comprising a sleeve introducer having	
2	a tapered distal end and a lumen therethrough, said sleeve introduced being configured to		
3	receive a guidewire through its lumen and to be received within the lumen of the sleeve,		
4	whereby an assembly	of the sleeve and sleeve introducer can be formed so that the	
5	tapered end of the sleeve introducer can be advanced through the tissue to facilitate entry		
1	49.	A kit as in claim 46, further comprising a needle.	
1	50.	A kit as in claim 46, further comprising a package wherein the	
2	sleeve, dilator, and g	uidewire are contained in the package in a sterile condition.	